Therefore, in one aspect of the invention there is provided a photonic crystal having a tunable photonic band structure, comprising;

a periodic composite dielectric material having at least two dielectric constituents including a first dielectric constituent having a first refractive index and a second dielectric constituent having a second refractive index smaller than the first refractive index so that the periodic composite dielectric material has a photonic band structure; and

at least of said at least two dielectric constituents having refractive index properties which can be locally or globally changed throughout said photonic crystal in a controlled manner whereby changing the refractive index properties modulates said photonic band structure locally or globally throughout said photonic crystal for providing control of propagation of light through said photonic crystal.

In another aspect of the invention there is provided a photonic crystal having a tunable photonic band structure, comprising;

a periodic composite dielectric material having a first dielectric constituent having a first refractive index and void regions located periodically throughout a volume of said periodic composite dielectric material, a second dielectric constituent located in said void regions having a second refractive index sufficiently smaller than the first refractive index so that the periodic composite dielectric material has a photonic band structure; and

at least one of said first and second dielectric constituents being optically anisotropic and having refractive index properties which can be locally or globally

A1 cont'd

modified in a controlled manner whereby changing the refractive index properties changes said photonic band structure for providing control of propagation of light through said photonic crystal.

Delete the paragraph on page 6, lines 19 to 28, and replace with the following paragraphs as follows:

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In another aspect of the invention there is provided a method of tuning a photonic band structure in a photonic crystal, comprising;

providing a photonic crystal having a periodic composite dielectric material including a first dielectric constituent having a first refractive index, and at least a second dielectric constituent having [an] a second refractive index constant sufficiently smaller than the first refractive index so that the periodic composite dielectric material has a photonic band structure; and

globally or locally changing the refractive index properties of one of said first and second dielectric constituents in a controlled manner so that said photonic band structure is changed in a controlled manner by application of one of an electric, magnetic and electromagnetic field for providing control of propagation of light through said photonic crystal.
